

PCT**INTERNATIONAL PRELIMINARY EXAMINATION REPORT**
(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P12814/OLL	FOR FURTHER ACTION See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)	
International application No. PCT/EP 03/06724	International filing date (day/month/year) 26.06.2003	Priority date (day/month/year) 01.07.2002
International Patent Classification (IPC) or both national classification and IPC H04R1/02		
Applicant SONY ERICSSON MOBILE COMMUNICATIONS AB ET AL.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 5 sheets, including this cover sheet.

This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

These annexes consist of a total of 2 sheets.

3. This report contains indications relating to the following items:
 - I Basis of the opinion
 - II Priority
 - III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
 - IV Lack of unity of invention
 - V Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
 - VI Certain documents cited
 - VII Certain defects in the international application
 - VIII Certain observations on the international application

Date of submission of the demand 27.12.2003	Date of completion of this report 26.10.2004
Name and mailing address of the international preliminary examining authority:  European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Fülöp, I Telephone No. +31 70 340-1963



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International application No. PCT/EP 03/06724

I. Basis of the report

1. With regard to the **elements** of the international application (*Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17)*):

Description, Pages

1-9 as originally filed

Claims, Numbers

1-12 filed with telefax on 08.10.2004

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

These elements were available or furnished to this Authority in the following language: , which is:

- the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).
- the language of publication of the international application (under Rule 48.3(b)).
- the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

- contained in the international application in written form.
- filed together with the international application in computer readable form.
- furnished subsequently to this Authority in written form.
- furnished subsequently to this Authority in computer readable form.
- The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.
- The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

- the description, pages:
- the claims, Nos.: 13-17
- the drawings, sheets:

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5. This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

(Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N) Yes: Claims 1-12
No: Claims

Inventive step (IS) Yes: Claims 1-12
No: Claims

Industrial applicability (IA) Yes: Claims 1-12
No: Claims

2. Citations and explanations

see separate sheet

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Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:
 - D1: EP-A-1 184 936 (NOKIA MOBILE PHONES LTD) 6 March 2002 (2002-03-06)
 - D2: WO 01/01591 A (KONINKL PHILIPS ELECTRONICS NV ;YAMAMOTO SHIGERU (NL)) 4 January 2001 (2001-01-04)
2. Document D2, which is considered to represent the most relevant state of the art, discloses a speaker 17 placed inside a communication terminal behind the user interface provided in front of the above mentioned communication terminal from which the subject-matter of claim 1 differs in that the speaker is positioned "completely" behind the user interface and a longitudinally extending sound channel, including a bended portion, connects the sound output of the speaker to the front of the terminal.

This couple of features allow for a greatly improved miniaturisation of the communication terminal combined with the advantage that a larger portion of the front surface can be covered by the user interface as the size and placement of the speaker will in no way limit how large the user interface can be. Moreover, the use of a longitudinally extending channel provides a higher degree of freedom for how and where to place the speaker inside the terminal.

The combination of the above mentioned features are neither known from, nor rendered obvious by, the available prior art as, although document D2 (see figure 2) makes reference to a speaker placed partly behind a user interface, the idea of using a longitudinal sound channel in order to be able to eliminate completely the longitudinal extension of the speaker from the total length of the terminal is not mentioned or suggested in any of the available prior art documents.

Consequently, the subject-matter of claim 1 is novel and involves an inventive step according to the criterion set forth in PCT Articles 33(2) and 33(3) in conjunction with PCT Rules 64(1)-(3) and 65(1)(2).

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3. The dependent claims 2-12 define particular embodiments of claim 1 which are not considered obvious.

Claims

1. Communication terminal (11) comprising a housing (12), a user interface (13,14) on a front side (20) of the housing, said housing carrying therein a radio antenna element (27), a PCB (24) including a ground plane extending longitudinally through the terminal behind said user interface, a speaker (16), and a chamber (21) acting as an electromagnetic resonance cavity for the antenna and as an acoustic resonance cavity for the speaker, wherein said speaker is mounted inside said chamber, **characterised in** that said speaker is placed behind said PCB and behind said user interface as seen from said front side, wherein an opening (28) is formed in said PCB at the speaker, and wherein a sound channel (22) extends from said opening longitudinally in the terminal between said PCB and said user interface, and includes a bent portion (23), such that the sound channel bends around said user interface at an end portion of the terminal, and extends at a channel front outlet (17) substantially perpendicular to said front side.
2. The communication terminal as recited in claim 1, **characterised in** that said sound channel further has a channel top outlet (19) extending in a substantially longitudinal direction of the terminal at a top side of said housing.
3. The communication terminal as recited in claim 1, **characterised in** that said user interface is a display (13).
4. The communication terminal as recited in claim 1, **characterised in** that said user interface is a key pad (14).
5. The communication terminal as recited in any of the previous claims, **characterised in** that said ground plane (24) defines a wall part of the chamber, through which wall part said sound channel outlet extends.
6. The communication terminal as recited in any of the previous claims, **characterised in** that said chamber is sealed (26).
7. The communication terminal as recited in any of the previous claims, **characterised in** that said chamber has a substantially rectangular box shape.
8. The communication terminal as recited in any of the previous claims, **characterised in** that said antenna element comprises a substantially flat pattern of conductive material on a wall (29) of said chamber.

9. The communication terminal as recited in any of the previous claims, **characterised in** that said speaker is devised to convey audio information such as speech to a terminal user.

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10. The communication terminal as recited in any of the previous claims, **characterised in** that said speaker is devised to act as a ringer by transmitting a predetermined sound signal to bring a user's attention to the terminal.

10 11. The communication terminal as recited in any of the claims 1 - 9, **characterised in** that said speaker comprises a buzzer devised to act as a ringer by transmitting a predetermined sound signal to bring a user's attention to the terminal.

15 12. The communication terminal as recited in any of the claims 1 - 9, **characterised in** that said speaker is a multi mode actuator devised to act as a ringer and as a vibrator by transmitting predetermined sound signals or vibrations to bring a user's attention to the terminal.